

REMARKS

In the subject Office Action, the examiner rejected Claims 1-9 under 35 USC 102(b) as being anticipated by Aboutalib et al. Applicant requests reconsideration of his application in view of this response which amends Claims 1-4 and 6, cancels Claim 5, and provides argument supporting allowance of the pending claims.

Claims 1-4 have been amended to clarify Applicant's invention, and Claim 6 has been amended for consistency with the amended language of Claims 1 and 3. In no event does the amended claim language contain any new matter.

Amended Claim 1 includes the steps of:

forming a difference image corresponding to differences between said search window and a corresponding portion of said first video image;

identifying at least one eye movement candidate region in the difference image;

determining a centroid of the eye movement candidate region and extracting a patch from the search window based on the determined centroid, and

identifying eyelid motion between the first and second video images when the extracted search window patch has the appearance of an eye, and thereupon updating the state vector for the second video image according to the determined centroid.

These steps define a process for frame-to-frame updating of a state vector that designates the location of a subject's eye without executing a time-consuming correlation process when frame-to-frame eyelid motion of a detected eye is identified. Claim 3 recites that the state vector is updated using the correlation process when a lack of frame-to-frame eyelid motion is identified.

Aboutalib et al. describe a frame-to-frame eye tracking method that *always* relies on a correlation process between one or more cut-out pixel blocks from the current frame and a matrix of pixel intensity values from the previous frame; see blocks 502-508 of

FIG. 5A and column 10, lines 48 et seq. High correlation values identify potential eye locations in the current frame; see blocks 508-510 of FIG. 5A-5B and column 11, lines 19-36. A blink is detected if the high correlation becomes low for several consecutive frames, and in this event, the status of the corresponding eye location is upgraded to high confidence; see blocks 512-514 of FIG. 5B and column 11, lines 38-52. In other words, eye blink detection is only used to pick out the best potential eye location. This is clearly not anticipative, or even suggestive, of amended Claim 1. In fact, Aboutalib et al. fail to anticipate, teach or suggest any of the excerpted steps of the preceding paragraph. And these differences have a significant impact on tracking performance. Whereas the claimed method detects eyelid motion between two consecutive frames, Aboutalib et al. require several consecutive video frames to detect eye blinking; and whereas the claimed method avoids the need for correlation calculations when eyelid motion is detected, Aboutalib et al. perform the same set of correlation calculations regardless of whether eye blinking is detected.

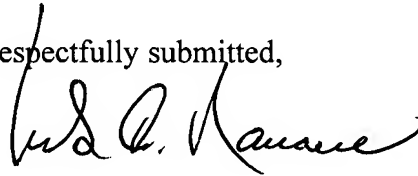
For the above reasons, Applicant respectfully requests that the rejection of Claim 1 be withdrawn. Applicant likewise requests that the rejection of Claims 2-4 and 6-9 be withdrawn, at least for the reason that such claims depend directly or indirectly from Claim 1. Additionally, amended Claims 2 and 4 describe a method for determining whether an extracted search window patch has the appearance of an eye (or not), which method steps are neither shown nor suggested by Aboutalib et al. And Claims 6-9 describe the correlation technique of Claim 3, which in several respects is not disclosed by Aboutalib et al. For example: (1) the claimed correlation is between the eye template and search window of the current frame, whereas Aboutalib et al. describe a correlation between cut-out pixel blocks from the *current* frame and a matrix of pixel intensity values from the *previous* frame; and (2) the claimed correlation involves establishing eye and non-eye models and computing deviations of search window regions from the model, whereas Aboutalib et al. describe only a simple matrix correlation process (see column 11, lines 10-13).

In conclusion, Applicant respectfully submits that Claims 1-4 and 6-9 are in

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condition for allowance, and therefore requests that such claims be allowed.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Mark A. Navarre". The signature is written in dark ink and is positioned below the text "Respectfully submitted,".

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